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Perks as Second Best Optimal Compensations

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Alberto Bennardo^{*}, Pierre-André Chiappori^{} and Joon Song^{***}**

Abstract

The finance literature views perks either as productivity enhancing expenditures or as a result of poor managerial control by shareholders. Using a corporate jet to attend a business meeting may be justified because of the returns generated for the firm; but flying on the same jet to reach a vacation resort reflects a misappropriation of the firm's resources by the manager. Our paper challenges this view. We argue that complementarity between leisure and wages creates difficult incentive problems, because the bonuses or stock options that reward success increase the marginal disutility of effort. In such a context, we show that whenever there exist commodities ('perks') that are substitute to leisure (or even less complementary to leisure than money), the optimal incentive scheme involves overprovision of such commodities, in the sense that the agent should consume more of them than she would elect to, should she be given a choice between money and perks at the current market prices. This conclusion is valid even when perks must be provided independently of the manager's performance. Finally, we discuss the role of governance by introducing manipulations à la Peng and Röell (2006), and show that, in contrast with standard intuition, perks are used even when governance is perfect, and poorer governance may result in *less* perks being offered to the agent.

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Perquisites, or 'perks', are non monetary compensations that firms offer to select employees. They may include the personal use of chauffeur-driven limos or executive jets, membership in select clubs, financial counseling, tax preparation and estate planning, retirement packages, etc. In many cases, perks represent significant amounts. A recent survey of the compensations received in 2006 by several Silicon Valley's chief executives¹ indicates that Larry Ellison, Oracle's CEO, received almost two millions in 'perks and other compensations'; Meg Whitman (eBay) landed more than one million, and several other CEOs received \$500,000 or more. Moreover, perks are not exclusive to CEOs; the same survey indicates that in several firms, the perks received by other top executives (CFO, COO, SVP) are close to, and sometimes larger than those of the CEO.² Nor is the perk phenomenon specific of large, private corporations. Several universities provide faculty housing below market prices; and a recent newspaper article reported that the Chancellor of a top university charged its institution \$11,000 in season tickets to a theater. Finally, while some perks may seem largely related to business and professional activities, other are not; some do not actually benefit the exec-

¹Equilar, Mercury News research, 2007

²For instance, Stephen McGowan, CFO and EVP of Sun Microsystems, received perks for an amount of \$922,830, more than the CEO.

utive herself, but rather her family - examples include kindergarten services or access to selective private schools, airplane tickets or use of company jet for spouse or children, and others.³

While the amounts spent on perks often represent only a small fraction of the total compensation received by the beneficiaries, their mere existence raises a simple question - namely, why not pay the corresponding amounts in cash and let the employees free to purchase these products (or any alternative they may fancy) by themselves? Particularly intriguing is the fact that most of the time, the corresponding products or services are unlikely to be purchased by the agents (or at least not in the same amount), should they receive the cash equivalent. This suggests that the utility derived from this particular form of compensation may be quite small in regard of its cost -

³As an example, consider the following excerpt from an article published in the New York Times:

"Some high school students will be making their way back to school this week on a bus or, if they are lucky, in their own car. But the stepdaughter of Edward Mueller, the new chief executive of Qwest Communications, has a much fancier option....A regulatory filing made Friday, on the eve of the holiday weekend, disclosed that Qwest has authorized Mr. Mueller's wife and her daughter to use Qwest Corporate jet to travel between Denver, where the telecommunications company is based, and California, where Mr. Mueller's stepdaughter is finishing high school. [...] Asked about the filing by the Rocky Mountain News, a Qwest spokesman said the agreement reflects an appreciation for his family situation as his daughter wraps up her schooling in California". New York Times, September 4, 2007

therefore that perks are, at least in a first best world, a particularly inefficient (and distorsive) way of paying compensations.

In the financial literature, the standard explanation of perks relies on some form of agency problem; namely, perks are used by managers to (mis)appropriate some of the surplus generated by the firm, in a way that is neither approved nor even acknowledged by shareholders. Cash transfers, while more efficient, would be more visible, hence less useful in terms of surplus extraction. In short, perks are the consequence of poor monitoring of the managers by the shareholders - a view that lies at the core of a host of theoretical papers in corporate finance.⁴ This interpretation, however, has recently be challenged by Raghuram Rajan and Julie Wulf (2006). In their paper, Rajan and Wulf use a large database on executive compensation to carefully examine the empirical relevance of several predictions generated by the standard agency model used in most of the corporate finance literature. Overall, they find little support for it. For instance, they find no direct relation between governance and perks, nor any impact of exogenous changes in governance on perk consumption; and they show that standard indicators of external monitoring, such as board size, fraction of outside directors or institutional investor

⁴See for instance Grossman and Hart (1980), Jensen and Meckling (1976), Jensen (1986) and Aghion and Bolton (1992).

ownership, are unrelated to perks used for personal purposes. They tellingly conclude that despite ‘occasional aberrations, [...] treating perks purely as managerial excess is incorrect’.

Alternative justifications for perks have been suggested. For instance perks may in some case allow to exploit tax loopholes. This argument helps explaining some but not all perks, in particular because the tax advantage has to be traded off with the utility loss linked with the in kind provision of less desired commodities.⁵ Rajan and Wulf, on the basis of their empirical analysis, suggest still another explanation: firms offer as perks goods that increase workers’ productivity. Such a direct provision is efficient because managers’ private incentives to consume perks fall short of their ‘social’ incentives whenever firm can appropriate part of these productivity gains⁶. This intuition has been formalized in a recent paper by Marino and Zaboljnik (2008). In their setting, perks serve as a nonlabor input that increases the agent’s productivity. They show that perks are generally offered even

⁵Rajan and Wulf find that state marginal tax rates have a statistically significant impact on the use of company car, country club membership and financial counseling. However, the use of chauffeur and corporate jets is not significantly linked to state taxes. Moreover, recent, increased pressure from the IRS to declare perks as taxable income did not significantly reduce the use of perks over the corresponding period (Rajan and Wulf 2006).

⁶Noteworthy, this explanation seems to implicitly refer to a moral hazard problem : were it possible to pay a manager conditional on its true effort, a worker would have appropriate incentives to consume productivity enhancing commodities

when their direct consumption benefits are offset by their costs, and derive comparative static results.

The Rajan/Wulf/Marino/Zabojnik argument can justify some of the perks actually observed, from the provision of a laptop to the availability of the company jet for business-related travel. However, it applies only insofar as the perks actually increase the agent's productivity; it precludes any purely private (non business-related) consumption of perks. Advantages like financial counseling, retirement packages, or private use of the corporate jet - let alone kindergarten, private schools or family use of the corporate jet - can hardly be justified by their impact on the agent's productivity. Therefore, in the traditional view, their existence can only be the by-product of some kind of managerial misconduct.

In this paper, we propose an alternative and complementary justification for perks that challenges traditional wisdom. Specifically, we argue that in a context of asymmetric information, perks are typically part of the (second-best) optimal incentive scheme *even when they have no impact on the agent's productivity*. Firms may rationally want to pay perks that are not directly productive, because such a compensation reduces the cost of providing adequate incentives to the employee. The basic idea is that, in

general, an agent's utility depends on effort (or leisure) and consumptions in a *non separable* way. Non separability of leisure and consumption is a standard finding of the empirical literature on labor supply (see for instance Browning and Meghir (1997)). It reflects the very natural intuition that, in general, the marginal utility of leisure increases with wealth, if only because number of consumable goods (travel, services,...) are complements of leisure; for instance, a free week-end is both more expensive and more enjoyable when spent skiing down Colorado slopes or sailing along the coast of some Caribbean island rather than idling in Brooklyn.⁷ Non separability between effort and consumption is moreover a standard conclusion in the recent literature on CEO compensation. Several patterns of executive compensations (e.g., the negative relationship between the CEO's effective equity stake and firm size, the positive correlation between the respective volatilities of the firm's value and the manager's wealth, or the fact that the dollar change in

⁷A Beckerian justification, used for instance by Bennardo and Chiappori (2003), relies upon the existence of a domestic production function that produce some agent-specific commodity, using time and the consumption good as complementary inputs. In this case, the marginal utility of consumption typically increases with leisure. To see why, assume that well-being is proportional to the consumption of a single household good ξ , produced from some constant return to scale technology :

$$\xi = f(c, 1 - e) = (1 - e) \phi \left(\frac{c}{1 - e} \right)$$

where ϕ is increasing concave. Then $\frac{\partial^2 v}{\partial c \partial e} = \frac{\partial^2 f}{\partial c \partial e}$ is always negative.

wealth for a percentage change in firm value, scaled by annual pay, is independent of firm size) are incompatible with preferences that are additively separable in effort and consumption, while they directly stem from models using a multiplicative (therefore non separable) specifications, as demonstrated by Edmans, Gabaix and Landier (2008).

In the moral hazard setting we consider, complementarity of leisure and consumption has a crucial consequence⁸; namely, direct compensations, in terms of (performance-related) cash payments, tend to increase the disutility of effort, which exacerbates moral hazard issues. At the very high income level reached by many top executives, the (marginal) value of leisure is so high (and the marginal utility of money so low) that providing adequate incentives becomes extremely costly; moreover, such incentives, by further increasing the subjective cost of activity, may even be counterproductive, a case illustrated by Bennardo and Chiappori (2003).

We investigate the consequences of this remark from a second best perspective, in a multicommodity setting. A standard second best analysis concludes that the optimal contract typically involves consumptions pat-

⁸The implications of non separable preferences for moral hazard problems were initially recognized by Grossman and Hart (1983). For a recent and more thorough investigation, see Bennardo and Chiappori (2003)

terns that are distorted vis à vis both the first best and the agent's unconstrained choices, in order to fully exploit the different complementarity/substitutability properties of each commodity with respect to leisure. Specifically, we show, in a simple model in which the agent can consume leisure, a numeraire good ('money') and a third commodity, the 'perk', that if the perk good is a *substitute to leisure*, in the (usual) sense that consumption of the former decreases the marginal utility of the latter, then the second best optimum entails a *larger* consumption of perks than what the agent would freely select. Moreover, the conclusion holds under weaker assumptions; actually, one only needs perks to be 'less complement to leisure' (in a sense we precisely define) than the numeraire.

One can easily accept that giving a top executive access to a corporate jet to facilitate her professional travels could be efficient. We argue, however, that the conclusion may extend to *private* use of the jet, insofar as it can be a substitute for alternative uses of the agent's time. When she wants to reach Aspen for a ski week-end, a top executive faces a choice between leaving her office early on Friday afternoon in prevision of the long hours required for the connections between regular flights, or attending this crucial but late meeting on Friday evening and taking next a direct flight on the company jet.

Here, access to the private flight on Friday night reduces the marginal utility of leisure; in a second best context, this property should be exploited to provide incentives optimally. By the same token, saving an employee's time by providing her with adequate assistance in tax preparation, estate planning or financial counseling will generally be efficient, even if the consumption of these services is purely private and does not directly increase her productivity in the office. On a less fancy tone, availability of subsidized housing located near the campus reduces the time academics spend commuting; it is thus second best efficient in general.

A second conclusion is that if, as argued above, leisure and money are complement, then the optimal compensation plan will entail overconsumption of the perk good whenever the latter is 'less complementary to leisure' than money, in a sense we precisely define. In particular, even if the agent's utility is separable in leisure and perks, so that consumption of perks has no impact on the marginal disutility of effort, one still expect overprovision of perk at the optimum whenever leisure and money are complement, precisely because perks alleviate the negative impact of high wages on the cost of providing adequate incentives. In all these cases, the optimal incentive scheme requires that a fraction of the compensation be paid as perks. A regulation

reducing or prohibiting the use of perks would actually directly harm shareholders and result in social losses. A third conclusion is that when the non separability effects are not too strong, better paid managers (i.e., more productive managers or managers supplying their services in more competitive labor markets) receive a larger fraction of their compensation in the form of perks.

Our basic model can be extended in several directions. The second best efficient allocation of perks can, alternatively, be implemented by the introduction of subsidies over perk goods. We also consider the coexistence of several perk goods, and show that the basic intuition can be generalized: if a commodity, say i , is less complement to leisure than some other commodity, say k , then commodity i is ‘more overconsumed’ than commodity k at the optimum, in the sense that given the total expenditures on goods k and i , the agent would like to consume more good k and less good i than provided at the second best. Our basic intuition is also remains valid whether the provision of perk can depend on the state of the world or not; even when incentives cannot be provided by additional perks expenditures rewarding good performance only, perks are still overconsumed at the second best. Finally, we discuss the links between our second-best explanation of perks and

governance issues. While in our story perks are not directly caused by lack or governance, it is nevertheless the case that the provision of perks may, in the same second best spirit, be used to alleviate governance problems. We illustrate this general idea in a simple extension of our model, the main features of which are borrowed from Peng and Röell (2008). We show that, indeed, severe governance problems may impact the optimal allocation of perks. The conclusions, however, are quite different from the standard insights. Not only are perks present even when governance is perfect, but one can find robust examples in which more serious governance problems may result in *less* perks being provided at the optimum.

The related literature includes the seminal contribution of Grossman and Hart (1983), which was the first, to the best of our knowledge, to consider the effects of non separability of preferences on second best rewards schemes. Bennardo and Chiappori (2003) show that when the agent's preferences are non separable in effort and consumption, Bertrand competition may result in positive equilibrium profit for perfectly competitive principals. Our paper is an extension of theirs to a multi-commodity setting, but in a partial equilibrium environment. Peng and Röell (2008) assume non separable preferences to investigate the effects of managerial manipulation of performance

measurement and characterize second best contracts in a single good environment. Jensen (1986), a representative of the conventional corporate finance literature on perks, argues managers working for firms generating larger cash-flow get larger perks, while firms with better external governance pay less perks in the spirit of Jensen and Meckling (1976). Yermack (2006) empirically investigates the link between perks and external governance. He finds that the disclosure of a CEO's personal use of a company plane leads to underperforming average shareholder returns.

Section 1 describes basic setting. Section 2 provides basic results with comparative statics. Section 3 discuss extensions of subsidized perks, several perks and state independent perks. Section 4 analyzes the effect of governance structure on perks. Section 5 concludes.

1 The Model

We consider a simple, principal-agent model in which a risk-neutral principal (the firm or its shareholders) maximizes expected profit while dealing with a risk averse agent (the top executive). When employed by a principal, an agent produces an output that can take two values Y and y , with $Y > y$. The

probability of achieving the high output Y depends on some unobservable effort level e . We assume for simplicity that effort can take only two values, e_L and e_H , with $e_H > e_L$; the ‘good’ outcome Y obtains with probability $P(e)$, where $P(e_H) = P$ and $P(e_L) = p < P$.

There are three commodities in this economy: leisure l , a numeraire good (‘money’) c and a third commodity, q , which we call a perk; we define ‘effort’ $e = 1 - l$. We ignore price variations, and normalize both prices to one. Note that, in this simplified setting, any compensation received by the agent that does not take the form of a perk is used to consume the alternative commodity. In other words, the (state-dependent) consumption of the numeraire good can be seen as a reduced form for any ‘standard’ type of outcome-related payment; these includes wage and bonuses, but also stock options or any sophisticated compensation.

In our analysis, the complementarity or substitutability between leisure on the one hand and consumption goods on the other hand plays a crucial role. To emphasize these aspects, we assume that an agent’s VNM utility function has the form

$$u(c, q, l) = v(c, l) + w(q, l) \tag{1}$$

so that we can ignore complementarity or substitutability between money and perk. The crucial aspect, which directly generalizes Bannardo and Chiappori (2003), is that effort is not separable from consumption of the numeraire good; i.e., the marginal utility of leisure (or equivalently the marginal disutility of effort) is

$$\frac{\partial u(c, q, l)}{\partial l} = \frac{\partial v(c, l)}{\partial l} + \frac{\partial w(q, l)}{\partial l}$$

which depends on both consumptions.

To keep the discussion more intuitive, we first assume that leisure and consumption of the numeraire are complements while leisure and perks are substitute (equivalently, that effort and money are substitutes while efforts and perks are complements), implying that:

$$\frac{\partial^2 v(c, l)}{\partial c \partial l} > 0 \quad \text{and} \quad \frac{\partial^2 w(q, l)}{\partial q \partial l} < 0$$

or equivalently, using effort:⁹

$$\frac{\partial^2 v(c, 1 - e)}{\partial c \partial e} < 0 \quad \text{and} \quad \frac{\partial^2 w(q, 1 - e)}{\partial q \partial e} > 0 \quad (2)$$

In particular, for the two effort level $e_L < e_H$, complementarity implies that

$$\frac{\partial v(c, 1 - e_L)}{\partial c} > \frac{\partial v(c, 1 - e_H)}{\partial c} \quad \text{for all } c.$$

while

$$\frac{\partial w(q, 1 - e_L)}{\partial q} < \frac{\partial w(q, 1 - e_H)}{\partial q} \quad \text{for all } q.$$

It must however be stressed that these assumptions, while natural, are significantly stronger than what we need. Our results simply require that perks be ‘less’ complementary to leisure than the numeraire is, in the follow-

⁹A particular case is the multiplicative form used by Edmans, Gabaix and Landier (who do not consider perks). Indeed, if, following these authors, we assume that

$$v = cg(e)$$

where g is decreasing, then

$$\frac{\partial^2 v}{\partial c \partial e} = g'(e) < 0$$

ing, technical sense:

$$\frac{\partial v(c, 1 - e_L)}{\partial c} - \frac{\partial v(c, 1 - e_H)}{\partial c} > \frac{\partial w(q, 1 - e_L)}{\partial q} - \frac{\partial w(q, 1 - e_H)}{\partial q} \quad (3)$$

for all (c, q) . When leisure and consumption of the numeraire are complements while leisure and perks are substitute, as required by (2), we have indeed that:

$$\frac{\partial v(c, 1 - e_L)}{\partial c} - \frac{\partial v(c, 1 - e_H)}{\partial c} > 0 > \frac{\partial w(q, 1 - e_L)}{\partial q} - \frac{\partial w(q, 1 - e_H)}{\partial q},$$

and equation (3) is satisfied; but, obviously, (3) is much less restrictive than (2).

2 Optimal incentive-compatible contract

2.1 The main result

In what follows, we consider only deterministic contracts; i.e. we exclude randomization both ex ante (whereby agents face a lottery of possible contracts) and ex post (whereby each agent, contingent on his outcome realization, receives a lottery of possible payments). The interested reader is referred to

Bennardo and Chiappori for a detailed discussion of these issues. Let (C, Q) (resp. (c, q)) denote the agent's consumption vector when the high (low) production level is achieved. One can for instance think of c as the agent's basic wage, and of $C - c$ as the bonus paid in case of success. Alternatively, $C - c$ can be the value of the stock options received by the agent (assuming that the strike is such that they are exercised only in the good state of the world), or the capital gain made by the agent on the stocks she owns. Throughout the paper, we assume that the technology is such that the second best optimum entails provision of the high effort by the agent: incentives are worth being used.

The optimal incentive-compatible contract maximizes the principal's expected profit, subject to a participation constraint for the agent and the incentive compatibility constraint. The program is thus (assuming the high effort level is implemented):

$$\max PY + (1 - P)y - (P(C + Q) + (1 - P)(c + q))$$

under the constraints

$$P(v(C, 1 - e_H) + w(Q, 1 - e_H)) + (1 - P)(v(c, 1 - e_H) + w(q, 1 - e_H)) \geq \bar{U}$$

and

$$\begin{aligned} & P(v(C, 1 - e_H) + w(Q, 1 - e_H)) + (1 - P)(v(c, 1 - e_H) + w(q, 1 - e_H)) \\ & \geq p(v(C, 1 - e_L) + w(Q, 1 - e_L)) + (1 - p)(v(c, 1 - e_L) + w(q, 1 - e_L)) \end{aligned}$$

where \bar{U} is the agent's reservation utility.

Let us first consider the first best contract (i.e., the optimal contract if effort was contractible). It entails full insurance for the agent; i.e., the compensation package (c, q) does not depend on the output realization. Regarding the allocation between money and perks, the first order conditions imply that:

$$\frac{\partial v(C, 1 - e_H)}{\partial C} = \frac{\partial w(Q, 1 - e_H)}{\partial Q} \text{ and } \frac{\partial v(c, 1 - e_L)}{\partial c} = \frac{\partial w(q, 1 - e_L)}{\partial q}$$

In words, the individual's MRS between the two types of consumptions equals their relative price. Therefore the firm does not need to directly cover expenditures on perks; it may as well pay a global wage equal to $C + Q$ in the high output case and $c + q$ otherwise, and let the agent freely choose her consumptions on the spot market. We conclude that in the absence of moral hazard, perks should not be part of the compensation package.

We now analyze the moral hazard situation. The first order conditions

are:

$$\frac{1}{\partial v(C, 1 - e_H) / \partial C} = \lambda + \mu \left(1 - \frac{p}{P} \frac{\partial v(C, 1 - e_L) / \partial C}{\partial v(C, 1 - e_H) / \partial C} \right) \quad (C1)$$

$$\frac{1}{\partial w(Q, 1 - e_H) / \partial Q} = \lambda + \mu \left(1 - \frac{p}{P} \frac{\partial w(Q, 1 - e_L) / \partial Q}{\partial w(Q, 1 - e_H) / \partial Q} \right) \quad (C2)$$

$$\frac{1}{\partial v(c, 1 - e_H) / \partial c} = \lambda + \mu \left(1 - \frac{1 - p}{1 - P} \frac{\partial v(c, 1 - e_L) / \partial c}{\partial v(c, 1 - e_H) / \partial c} \right) \quad (C3)$$

$$\frac{1}{\partial w(q, 1 - e_H) / \partial q} = \lambda + \mu \left(1 - \frac{1 - p}{1 - P} \frac{\partial w(q, 1 - e_L) / \partial q}{\partial w(q, 1 - e_H) / \partial q} \right) \quad (C4)$$

where λ and μ are the respective Lagrange multipliers of the participation and the incentive compatibility constraint.

Constraints (C1) and (C2) imply that:

$$\frac{1}{\partial w(Q, 1 - e_H) / \partial Q} - \frac{1}{\partial v(C, 1 - e_H) / \partial C} = \mu \frac{p}{P} \left(\frac{\partial v(C, 1 - e_L) / \partial C}{\partial v(C, 1 - e_H) / \partial C} - \frac{\partial w(Q, 1 - e_L) / \partial Q}{\partial w(Q, 1 - e_H) / \partial Q} \right)$$

Multiplying both sides by $\partial v(C, 1 - e_H) / \partial C$, we see that:

$$\begin{aligned} MRS(C, Q) - 1 &= \mu \frac{p}{P} \left(\frac{\partial v(C, 1 - e_L) / \partial C}{\partial v(C, 1 - e_H) / \partial C} - \frac{\partial w(Q, 1 - e_L) / \partial Q}{\partial w(Q, 1 - e_H) / \partial Q} \frac{\partial v(C, 1 - e_H) / \partial C}{\partial v(C, 1 - e_H) / \partial C} \right) \\ &= \mu \frac{p}{P} \left(\frac{\partial v(C, 1 - e_L)}{\partial C} - \frac{\partial v(C, 1 - e_H)}{\partial C} + \frac{\partial v(C, 1 - e_H)}{\partial C} - \frac{\partial w(Q, 1 - e_L) / \partial Q}{\partial w(Q, 1 - e_H) / \partial Q} \frac{\partial v(C, 1 - e_H)}{\partial C} \right) \\ &= \mu \frac{p}{P} \left(\frac{\partial v(C, 1 - e_L)}{\partial C} - \frac{\partial v(C, 1 - e_H)}{\partial C} + MRS(C, Q) \left(\frac{\partial w(Q, 1 - e_H)}{\partial Q} - \frac{\partial w(Q, 1 - e_L)}{\partial Q} \right) \right). \end{aligned}$$

therefore:

$$MRS(C, Q) := \frac{\frac{\partial v(C, 1-e_H)}{\partial C}}{\frac{\partial w(Q, 1-e_H)}{\partial Q}} = \frac{1 + \mu \frac{p}{P} \left(\frac{\partial v(C, 1-e_L)}{\partial c} - \frac{\partial v(C, 1-e_H)}{\partial c} \right)}{1 + \mu \frac{p}{P} \left(\frac{\partial w(Q, 1-e_L)}{\partial q} - \frac{\partial w(Q, 1-e_H)}{\partial q} \right)} \quad (4)$$

From property (3) above, the right hand side of (4) is larger than unity.

Therefore

$$\frac{\partial v(C, 1-e_H) / \partial C}{\partial w(Q, 1-e_H) / \partial Q} > 1$$

and by the same token

$$\frac{\partial v(c, 1-e_H) / \partial c}{\partial w(q, 1-e_H) / \partial q} > 1$$

We can therefore state the following result:

Proposition 1 *If condition (3) is satisfied, then the optimal second best contract is such that the perk good is overconsumed, in the sense that the marginal rate of substitution between money and the perk good is larger than the corresponding price ratio.*

In words, the optimal contract is such that the marginal utility of money is strictly larger than that of perks: the agent would, from an ex post perspective, prefer to consume less perks and more of the numeraire good. In

particular, should she receive her entire compensation as a monetary wage, the quantity of perk she would buy would be smaller than the second best quantity. Therefore, *efficiency requires perks to be provided in kind, in excess of the quantity the agent would freely purchase on the market.* Not surprisingly, perks are usually luxury goods, which even wealthy executive would not buy in large quantities by themselves.

In practice, our framework encompasses a number of special cases. One is the company plane example described above. Here, the perk (access to a company plane) is a direct substitute to leisure. Even if the agent's utility is separable in leisure and money (i.e., $v(C, 1 - e) = \bar{v}(C) + \bar{u}1 - e$) - so that a higher wage does *not* increase the marginal disutility of effort - the optimal contract still entails overprovision of perks because perks, by reducing the agent's disutility of effort, lower the cost of providing adequate incentives.

Alternatively, if money and leisure are indeed complements in the agent's utility function, then any commodity that can be consumed without (too much) increasing the disutility of effort can be used as a perk, and the second best optimum entails overprovision of it. It is tempting to think of symbolic gratifications, status or positional goods in these terms. A larger office, the availability of a private chauffeur, membership of an exclusive club are

signals that convey important information about the person's status within the organization.¹⁰ To the extent that they do not increase disutility of effort (and one could actually argue that, if anything, they reduce it), they should be part of the optimal compensation package.¹¹

2.2 Comparative statics

In general, moral hazard models with non separable preferences do not generate clear-cut comparative statics properties. If however, we restrict our attention to situations in which the non separability effects are not too strong¹² (i.e., if we perform our comparative static analysis 'in the neighborhood of separability'), several results can be demonstrated¹³ First, when the agent's reservation utility \bar{U} increases, then both her monetary wage and the amount of perks she receives increase. If, moreover, perks are luxury goods in the

¹⁰As noted by Rajan and Wulf, the signal is all the more credible that the total supply of such signals is limited. 'There are only so many corner offices or so many places on the corporate jet, and who gets them can signal the recipient's place in the pecking order better than cash compensation can' (Rajan and Wulf, 2006, p. 6).

¹¹This intuition is well expressed by Rajan and Wulf: 'If relative standing within the firm is an important element of the utility derived from compensation (see Frank, 1985a,b), then perks can motivate far more cost-effectively than equivalent amounts of cash.' (2006, p.6).

¹²These are situations in which although perks are used at the second best solution, their optimal level remains small with respect to the monetary incentives - which fits pretty well observed data.

¹³Formal proofs are available from the authors upon request.

usual sense, then the fraction of total compensation paid as perks increases as well. In short, better paid agents receive proportionally more perks - a finding that is consistent with the findings of Rajan and Wulf. Secondly, perks should be larger for more productive managers, and also for managers supplying their services in more competitive markets. Moreover, if the probability p of a low effort being undetected is larger, then the amount Q of perks paid if the outcome is high must increase; however, the amount q paid in the alternative situation may either increase or decrease, so that the overall impact is indeterminate. The (somewhat counterintuitive) conclusion is that although perks, in our model, are used to alleviate moral hazard problems, more severe moral hazard may not result in more perks being offered on average. Our model generates a more subtle prediction - namely that when moral hazard issues are more stringent, the level of perks *rewarding good performance* should be higher.

3 Extensions

3.1 Subsidized perks

The model can readily be extended in several directions. First, the mere notion of perks implicitly relies on an exclusivity assumption, in the contract theory sense; i.e., it must be the case that the principal can monitor the agent's consumption, and in particular impose a consumption of perks larger than the amount the agent would have freely chosen. While this assumption makes sense in our specific context, it is not indispensable. In the absence of exclusivity, the optimum could still be implemented using subsidies; it would then require a lower monetary wage compensated by a subsidized access to perk goods. To see how, just note that the previous program characterizes the marginal rate of substitution between perks and the numeraire for each outcome realization. This MRS is larger than one, implying that the agent, if facing the market prices, would voluntarily purchase less perks than the second best amount. If, on the other hand, perks are subsidized so as to equate the price ratio to the second best MRS, then the agent's compensation may be paid in numeraire - she will spend the optimal amount on perk goods. Note, however, that the second best outcome requires a subsidy that varies

with the outcome; in other words, the agent's bonus in case of success is partly paid by giving her access to more subsidized perks. In that sense, providing agents with subsidized meals at the firm's cafeteria can be an efficient perk.

3.2 Several perks

A second extension is related to the case when several perks goods coexist. Assume that there exist n commodities that can be used as perks, and let us disregard issues linked to complementarity/substitutability between perks by assuming the following utility function, a direct generalization of (1):

$$u(c, q, l) = v(c, l) + \sum_i w_i(q_i, l) \quad (5)$$

If the marginal utility $\partial w_i(q_i, l) / \partial q_i$ is large enough when q_i goes to zero, the program leads to the following:

$$\frac{\partial v(C, 1 - e_H) / \partial C}{\partial w_i(Q_i, 1 - e_H) / \partial Q_i} = \frac{1 + \mu_P^p \left(\frac{\partial v(C, 1 - e_L)}{\partial C} - \frac{\partial v(C, 1 - e_H)}{\partial C} \right)}{1 + \mu_P^p \left(\frac{\partial w_i(Q_i, 1 - e_L)}{\partial Q_i} - \frac{\partial w_i(Q_i, 1 - e_H)}{\partial Q_i} \right)} \quad (6)$$

We conclude, again, that all perk that are substitute to leisure (or less complement to leisure than money, in the sense defined above) are overprovided at the optimum. An interesting consequence is that for any two perk

commodities (i, k) , we have that:

$$\frac{\partial w_k(Q_k, 1 - e_H) / \partial Q_k}{\partial w_i(Q_i, 1 - e_H) / \partial Q_i} = \frac{1 + \mu \frac{p}{P} \left(\frac{\partial w_k(Q_k, 1 - e_L)}{\partial Q_k} - \frac{\partial w_k(Q_k, 1 - e_H)}{\partial Q_k} \right)}{1 + \mu \frac{p}{P} \left(\frac{\partial w_i(Q_i, 1 - e_L)}{\partial Q_i} - \frac{\partial w_i(Q_i, 1 - e_H)}{\partial Q_i} \right)} \quad (7)$$

If commodity i is less complement to leisure than commodity k , in the sense that

$$\frac{\partial w_k(Q_k, 1 - e_L)}{\partial Q_k} - \frac{\partial w_k(Q_k, 1 - e_H)}{\partial Q_k} > \frac{\partial w_i(Q_i, 1 - e_L)}{\partial Q_i} - \frac{\partial w_i(Q_i, 1 - e_H)}{\partial Q_i}$$

then

$$\frac{\partial w_k(Q_k, 1 - e_L) / \partial Q_k}{\partial w_i(Q_i, 1 - e_H) / \partial Q_i} > 1$$

and commodity i is ‘more overconsumed’ than commodity k at the optimum, in the sense that given the total expenditures on goods k and i , the agent would like to consume more good k and less good i than provided at the second best.

3.3 State independent perks

In the previous analysis, perks are used, together with money, to reward effort. As a consequence, the level of perks depends on (and actually increases

with) the outcome; the implicit assumption being that it is indeed possible to vary the level of perks in response to the agent's observed performance. A more complex but sometimes more realistic situation occurs when the level of perks is either not flexible or has to be decided ex ante, i.e. before the outcome can be observed (say, because it affects the marginal disutility of effort only if consumed when the effort is actually performed). Then the agent's consumption of perks must be the same in all states of the world; in particular, the principal cannot use variations in the amounts of perks provided to create additional incentives. However, the previous conclusions are still valid: the optimal contract involves overprovision of perks, in the sense that should the manager receive, before the outcome is realized, a cash amount equal to the value of the second best optimal level of perks, she would have purchased less perks.

To see why, consider the second best program, which is now:

$$\max PY + (1 - P)y - PC - (1 - P)c - Q$$

under the constraints:

$$Pv(C, 1 - e_H) + (1 - P)v(c, 1 - e_H) + w(Q, 1 - e_H) \geq \bar{U}$$

and

$$\begin{aligned}
& Pv(C, 1 - e_H) + (1 - P)v(c, 1 - e_H) + w(Q, 1 - e_H) \\
& \geq pv(C, 1 - e_L) + (1 - p)v(c, 1 - e_L) + w(Q, 1 - e_L)
\end{aligned}$$

where Q denotes the (state-independent) level of perks.

First order conditions give:

$$\begin{aligned}
\frac{P}{v_c(C, 1 - e_H)} &= \lambda P + \mu \left(P - p \frac{v_c(C, 1 - e_L)}{v_c(C, 1 - e_H)} \right) \\
\frac{(1 - P)}{v_c(c, 1 - e_H)} &= \lambda (1 - P) + \mu \left((1 - P) - (1 - p) \frac{v_c(c, 1 - e_L)}{v_c(c, 1 - e_H)} \right) \\
\frac{1}{w_q(Q, 1 - e_H)} &= \lambda + \mu \left(1 - \frac{w_q(Q, 1 - e_L)}{w_q(Q, 1 - e_H)} \right)
\end{aligned}$$

The first two equations imply

$$\frac{P}{v_c(C, 1 - e_H)} + \frac{1 - P}{v_c(c, 1 - e_H)} = \lambda + \mu \left(1 - \left(p \frac{v_c(C, 1 - e_L)}{v_c(C, 1 - e_H)} + (1 - p) \frac{v_c(c, 1 - e_L)}{v_c(c, 1 - e_H)} \right) \right)$$

and since

$$p \frac{v_c(C, 1 - e_L)}{v_c(C, 1 - e_H)} + (1 - p) \frac{v_c(c, 1 - e_L)}{v_c(c, 1 - e_H)} > 1 > \frac{w_q(Q, 1 - e_L)}{w_q(Q, 1 - e_H)}$$

we conclude that

$$\frac{P}{v_c(C, 1 - e_H)} + \frac{1 - P}{v_c(c, 1 - e_H)} < \frac{1}{w_q(Q, 1 - e_H)}$$

which, since the function $1/x$ is strictly decreasing and convex, implies that:

$$P v_c(C, 1 - e_H) + (1 - P) v_c(c, 1 - e_H) > w_q(Q, 1 - e_H)$$

In words: if the agent was given, ex ante (before the state of the world is realized), a given amount of cash to be allocated between perks and the numeraire, the optimal choice would be such that the above relationship is satisfied as an equality; therefore the second best does involve overprovision of the perk.

4 Perks and Governance

In our model, lack of governance is not the main culprit for the existence of perks - moral hazard is. It does not follow, however, that perks are irrelevant for governance issues. To the extent that governance problems involve moral hazard - as they usually do - the provision of perks can, and will at the

optimum, be used to alleviate these problems. We shall illustrate this claim using a simple extension of our model that closely follows the technology introduced by Peng and Röell (2008). We therefore assume that, in addition to her productive effort, the agent can influence the principal's evaluation of her performance by undertaking a set of activities, ranging from devoting time and effort to develop a network of relations to any kind of creative accounting affecting her division's books. The crucial idea is that these activities are not beneficial to the principal (for instance, they do not increase the long term value of the stock) but may increase the agent's compensation (for instance because it is based on short term performance). One may think, for instance, that the agent's reward is based on a signal (say, end of year value of the stock) which is available before the realization of the true outcome (the long term value), and is only imperfectly correlated with it. The explanation of this divergence between the agent's payoff and the firm's (long term) interest is a standard theme of the financial literature (see for instance Bolton, Scheinkman, Xiong 2006), that we do not address here.¹⁴

We therefore assume, following Peng and Röell, that the agent chooses

¹⁴A more complex but probably more interesting setting would involve three players - the agent, the principal and the market - and allow for richer interactions between them - for instance, the principal may sometimes collude with the agent, whose manipulations may deceive the market. This is the topic of ongoing research.

two types of effort. One, denoted e as above, is productive and has a direct impact on the probability of reaching the good outcome. The other, denoted a , is a manipulation that has no impact on the long term output but may affect the interim signal on which the agent's reward is based. Formally, P , which is now interpreted as the probability of receiving the positive *signal*, is a function $P(e, a)$ of two variables; and utilities depend on both efforts, i.e. $v(C, 1 - f(e, a))$ and $w(Q, 1 - f(e, a))$ where $f(e, a)$, the cost of choosing the pair (e, a) , is increasing in its two arguments. Note that now the principal, while still willing to promote the productive effort e , would however like to discourage manipulation, which increases expected costs without benefits. Finally, we maintain the assumption that e can take only two values, $e_H > e_L$, and we similarly assume that $a \in \{a_L, a_H\}$ with $a_H > a_L$; and we simplify the notations by posing

$$P = P(e_H, a_L), P' = P(e_H, a_H), p = P(e_L, a_L), p' = P(e_L, a_H)$$

As before, $p < P$ and $p' < P'$; and $P' \geq P$ and $p' \geq p$, expressing the fact that manipulation works.

In this setting, the quality of governance is inversely related to the dif-

ferences $P' - P$ and $p' - p$. If governance is perfect, both numbers are zero, reflecting the impossibility of successful manipulations; and an increase in these differences can be interpreted as a worsening of governance.

A complete characterization of the relationship between governance and optimal level of perks is quite complex, and the conclusions generally depend on the parameters of the model. We shall simply emphasize two points, both of which go against the standard intuition that poor governance results in higher perks. First, if governance is ‘good enough’, manipulation is not a problem. The optimal contract is then the same as before, and involves perks. In other words, even under perfect governance, we expect the optimal contract to entail perks. The second point is more surprising. Start from a context of perfect governance (in which $P' = P$ and $p' = p$), and gradually increase the severity of the manipulation problem up to a point at which the initial contract is no longer incentive compatible. Then the second best contract has to be adapted to deter incentives to manipulate. In such a case, the optimal response may consist in *reducing* the perks. In other words, not only are perks compatible with good governance, but a deterioration of governance may optimally reduce the level of perks offered by the contract.

For the sake of simplicity, we consider the case of state-independent perks.

To get the intuition of the first result, note that the optimal contract now involves three incentives constraints, namely:

$$\begin{aligned}
& P(v(C, 1 - f(e_H, a_L)) + w(Q, 1 - f(e_H, a_L))) \tag{8} \\
& + (1 - P)(v(c, 1 - f(e_H, a_L)) + w(q, 1 - f(e_H, a_L))) \\
\geq & p(v(C, 1 - f(e_L, a_L)) + w(Q, 1 - f(e_L, a_L))) \\
& + (1 - p)(v(c, 1 - f(e_L, a_L)) + w(q, 1 - f(e_L, a_L)))
\end{aligned}$$

$$\begin{aligned}
& P(v(C, 1 - f(e_H, a_L)) + w(Q, 1 - f(e_H, a_L))) \tag{9} \\
& + (1 - P)(v(c, 1 - f(e_H, a_L)) + w(q, 1 - f(e_H, a_L))) \\
\geq & P'(v(C, 1 - f(e_H, a_H)) + w(Q, 1 - f(e_H, a_H))) \\
& + (1 - P')(v(c, 1 - f(e_H, a_H)) + w(q, 1 - f(e_H, a_H)))
\end{aligned}$$

$$\begin{aligned}
& P(v(C, 1 - f(e_H, a_L)) + w(Q, 1 - f(e_H, a_L))) \tag{10} \\
& + (1 - P)(v(c, 1 - f(e_H, a_L)) + w(q, 1 - f(e_H, a_L))) \\
\geq & p'(v(C, 1 - f(e_L, a_H)) + w(Q, 1 - f(e_L, a_H))) \\
& + (1 - p')(v(c, 1 - f(e_L, a_H)) + w(q, 1 - f(e_L, a_H)))
\end{aligned}$$

The first constraint expresses the fact that, in the absence of manipulation, the agent prefers taking the high level of productive effort. The second implies, conversely, that when choosing the high productive effort, the agent does not try to manipulate. Finally, the last constraint states that the combination high productive effort - no manipulation is preferred over low productive effort with manipulation. Now, if $P' = P$ and $p' = p$, manipulation has a cost (for the agent) but no benefit; the agent will therefore never choose a_H . In practice, (8) implies (10) and (9) is always satisfied. By continuity, the same conclusion holds if (P', p') is ‘close to’ (P, p) .

Regarding the second point, for the sake of brevity we simply provide an intuitive argument; a complete example is available upon request. Start from a situation in which (P', p') is ‘close to’ (P, p) , so that the second best contract can be implemented without manipulation risk, and increase (P', p') up to the point where the second best contract is no longer implementable, because it would induce some manipulation from the agent. The contract must therefore be modified so as to reduce the incentives to manipulate, but without killing the incentives to choose the productive effort. This requires a change in the mix of incentives devices (bonus $C - c$ and perks q) used to provide incentives to the principal. In practice, the principal may either

offer a larger bonus and less perks or reduce the bonus and increase the perks; indeed, increasing both the bonus and the amount of perks would fail to deter manipulation, while reducing both the perks and the bonus would discourage the agent from exerting the productive effort. One can then check that if the manipulatory and the productive activities are substitutes (in the sense that $P' - P < p' - p$), then reducing perks may be the only way to satisfy the constraints simultaneously.

5 Conclusion

The finance literature views perks either as productivity enhancing expenditures or as a result of poor managerial control by shareholders. Using a corporate jet to attend a business meeting may be justified because of the returns generated for the firm; but flying on the same jet to reach a vacation resort reflects a misappropriation of the firm's resources by the manager. Our paper challenges this view. We argue that complementarity between leisure and wages creates difficult incentive problems, because the bonuses or stock options that reward success increase the marginal disutility of effort. In such a context, we show that whenever there exist commodities ('perks') that are

substitute to leisure (or even less complementary to leisure than money), the optimal incentive scheme involves overprovision of such commodities, in the sense that the agent should consume more of them than she would elect to, should she be given a choice between money and perks at the current market prices. Such perks can profitably be used for pure incentive purposes even when they generate no productivity gains.

Clearly, our story complements other explanations. There is little doubt that, in some situations, aberrant perks may signal managerial excess and surplus misappropriation, or can be simply explained by a desire to exploit tax loopholes. In other cases, perks directly increase the employee's productivity. It is interesting to note, in particular, that most of the empirical findings of Rajan and Wulf support both our explanation and the productivity enhancement story. For instance, they find that executives are more likely to be granted access to a corporate plane when local airports are small and poorly connected; obviously, these features increase the value of the plane both in terms of a productivity-enhancing tool and of a substitute to leisure. Empirical distinction could probably be established by comparing the consumption of perks by top executives of large, public firms versus self-employed entrepreneurs, since the moral hazard issue is reduced in the latter

case.

What our results suggest, however, is that perks may deserve a more careful investigation. A crucial aspect is the impact of the corresponding consumptions on the marginal disutility of effort. From a general perspective, our message is pretty straightforward: if, in the definition of executive compensations, moral hazard is an important issue, then the (second best) outcome will generally require overprovision (or subsidization) of any commodity that is a complement to the ‘effort’ under consideration. Throughout the paper, we adopt a specific interpretation of effort in terms of time spent working, and we accordingly emphasize the consumption/leisure trade-off. Of course, alternative interpretations of the notion of effort are possible. Our main point is valid from a fully abstract perspective; the only requirement is that, whatever the specific type of ‘effort’ one has in mind, the perks at stake are actually complements to it (or at least less substitutes than cash). For instance, if the main issue is avoiding excessive risk taking by the managers, then any consumption that increases the agent’s risk aversion should be subsidized. We nevertheless believe that our leisure interpretation is a natural and relevant one. Although most top executives work long hours, problems linked with insufficient labor supply (in the most usual sense) are

not unheard of;¹⁵ and the marginal value of a CEO's time is arguably so high that even fifty or sixty hours weeks may not be sufficient in some cases. Moreover, that most CEOs work much does not mean that they don't need incentives to do so, but rather that adequate incentives are actually provided by their current reward package, and presumably in an efficient way, i.e. at a minimum cost. Our results suggest that cost minimization is likely to entail the provision of perks, which is what we observe in practice.¹⁶ At any rate, while assessing complementarity or substitutability between any given perk and managerial effort is a challenging, empirical task, we nevertheless believe

¹⁵The following example is quite interesting in this respect:

‘During 10 critical days of this crisis – one of the worst in the securities firm’s 84-year history – Bear’s chief executive wasn’t near his Wall Street office. James Cayne was playing in a bridge tournament in Nashville, Tenn., without a cellphone or an email device. In one closely watched competition, his team placed in the top third.

As Bear’s fund meltdown was helping spark this year’s mortgage-market and credit convulsions, Mr. Cayne at times missed key events. At a tense August conference call with investors, he left after a few opening words and listeners didn’t know when he returned. In summer weeks, he typically left the office on Thursday afternoon and spent Friday at his New Jersey golf club, out of touch for stretches, according to associates and golf records. In the critical month of July, he spent 10 of the 21 workdays out of the office, either at the bridge event or golfing, according to golf, bridge and hotel records.’

The Wall Street Journal online edition, November 1, 2007

<http://online.wsj.com/article/SB119387369474078336.html>

¹⁶In our model, effort is discrete, so that incentives simply guarantee that the effort provided is maximum. While the discrete effort assumption is a simplification, it is in line with the recent literature, which argues that even when effort is continuous, it is often efficient to set it at its maximum level (see Edmans et al 2008).

that further work is needed in this direction.

Finally, we may expect the coming years to provide some natural tests of the various explanations at stake. In a 2006 report, the Security and Exchange Commission, while refusing to define the term "perk" because of its elusiveness, recommended more restrictive disclosure rules; in particular, all perks worth more than \$10,000 should be *publicly declared* by firms. The agnostic position of the regulatory agency seems quite appropriate in light of our results. More interestingly, if the traditional explanation of perks by the corporate governance literature - private appropriation is less visible, hence easier through perks than through wages, bonuses or stock options - is correct, then perks should all but disappear once they have to be publicly declared. If, on the contrary, perks are indeed an efficient productivity-enhancing or incentive device, then we should expect that they will mostly be maintained in the long run. Interestingly enough, while similar (although more lenient) disclosure requirements were implemented in 1993, they seem to have had little impact on the use of perks.¹⁷ From this perspective, the next future

¹⁷‘One might imagine that perks have come under increased scrutiny with additional SEC disclosure requirements and pressure from the IRS to declare perks as taxable income. With the caveat that our data do not allow us to distinguish between business and personal use, we find little variation in perks over the period in our sample.’ (Rajan-Wulf 2006, p. 14).

should be quite informative.

References

- [1] Aghion, Philippe & Bolton, Patrick, 1992. "An Incomplete Contracts Approach to Financial Contracting," *Review of Economic Studies*, Blackwell Publishing, vol. 59(3), pages 473-94, July.
- [2] Bennardo, Alberto & Chiappori, Pierre-Andre, 2003. "Bertrand and Walras Equilibria under Moral Hazard," *Journal of Political Economy*, University of Chicago Press, vol. 111(4), pages 785-817, August.
- [3] Browning, Martin, & Meghir, Costas, 1991. "The Effects of Male and Female Labor Supply on Commodity Demands," *Econometrica* 59 (July 1991): 925-51.
- [4] Bolton, Patrick, Scheinkman Josè & Wei Xiong, 2006. "Executive Compensation and Short-termist behaviour in speculative markets" *Review of Economic Studies* vol. 73, pages 577-610.
- [5] Edmans, A., X. Gabaix and A. Landier (2008), "A Multiplicative Model of Optimal CEO Incentives in Market Equilibrium", *Journal of Financial Economics*.

- [6] Grossman, Sanford J & Hart, Oliver D, 1983. "An Analysis of the Principal-Agent Problem," *Econometrica*, Econometric Society, vol. 51(1), pages 7-45, January.
- [7] Jensen, Michael C, 1986. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, American Economic Association, vol. 76(2), pages 323-29, May.
- [8] Jensen, Michael C. & Meckling, William H., 1976. "Theory of the firm: Managerial behavior, agency costs and ownership structure," *Journal of Financial Economics*, Elsevier, vol. 3(4), pages 305-360, October.
- [9] Marino, Anthony M. & Zàbojník, Ján, 2008. "Work-related perks, agency problems, and optimal incentive contracts," *RAND Journal of Economics*, RAND Corporation, vol. 39(2), pages 565-585.
- [10] Peng, Lin & Röell, Alisa, 2008. "Executive Pay, Earnings Manipulation and Shareholder Lawsuits," *Review of Finance*, 2008, 12, 141-184.
- [11] Peng, Lin & Röell, Alisa, 2008. "Manipulation and Equity based compensation" *American Economic Review, Papers and Proceedings* 98, 2, pages 285-290.

- [12] Rajan, Raghuram G. & Wulf, Julie, 2006. "Are perks purely managerial excess?," *Journal of Financial Economics*, Elsevier, vol. 79(1), pages 1-33, January.
- [13] Security Exchange Commission, 2006 "Executive Compensation and Related Person Disclosure, SEC Release No. 33-8732A
- [14] Yermack, David, 2006. "Flights of fancy: Corporate jets, CEO perquisites, and inferior shareholder returns," *Journal of Financial Economics*, Elsevier, vol. 80(1), pages 211-242, April.